

3.0 AFFECTED ENVIRONMENT

The proposed exploratory drilling operations, drilling and potential over-summering storage pads, one optional temporary camp, and most of the winter access routes are within the Northeast NPR-A Planning Area. However, the majority of the optional winter access corridor between Barrow and the two drilling sites, temporary camp sites along these access routes, and two staging pads near Barrow are outside the Planning Area. The optional near-shore routes on sea ice that would connect to the existing infrastructure east of the NPR-A are also outside the Planning Area. No permanent facilities are included in the proposed action.

This EA evaluates the proposed winter exploration using the conventional technology evaluated in the 1998 IAP/EIS and associated ROD. Winter exploration in the proposed project is also similar to activities previously evaluated by BLM in the following documents: EA: AK-023-02-005 (2002), EA: AK-023-02-004 (2001), EA: AK-023-01-001 (2000), and EA: AK-023-01-003 (2000). These EAs are incorporated in their entirety by reference per Council of Environmental Quality (CEQ) Regulation 40 CFR 1502.21. Winter exploratory drilling operations evaluated in these EAs were approved on federal land in NPR-A, in an area to the south - southeast of Teshekpuk Lake, approximately 6 to 30 miles west of Nuiqsut (about 35 miles southwest of the Alpine Field).

For a detailed discussion of the existing environment, see the IAP/EIS, which describes the general project area and its proximity to existing oil and gas fields on the North Slope (Figure 3).⁴⁰ Additional environmental descriptions are provided in other EAs associated with the Puviaq over-summering ice storage pad⁴¹ and previous NPR-A drilling programs, including the overland wintertime movement of drilling equipment from Camp Lonely to the Kuyanok wellsite⁴² and overland wintertime movement of drilling equipment from the South Meade Test Well No. 1 to the East Simpson wellsite (Figure 3).⁴³

⁴⁰ IAP/EIS. pp. III-A-1 through III-A-60; III-B-1 through III-B-633; and III-C-1 through III-C-66.

⁴¹ USDOI. BLM. EA: AK-023-02-033 (FF-093572). March 2002.

⁴² USGS. Environmental Assessment for the Kuyanok Test Well No. 1. 1980-81, signed January 6, 1981.

⁴³ USGS. Environmental Assessment for the East Simpson Test Well No. 1. 1978-79, signed March 6, 1979.

Accordingly, this EA focuses on areas not previously evaluated for authorized winter exploration programs in the NPR-A. Chapter IV of this EA discusses site-specific surface resources in relation to potential consequences of the proposed action.

3.1 PHYSICAL CHARACTERISTICS

The proposed drilling sites are approximately 7 to 10 miles inland from the Beaufort Sea coast, between the Ikpikpuk River and Teshekpuk Lake, with one site north of the Miguakiak River and one site south of the river. The Miguakiak River flows out of Teshekpuk Lake into the Ikpikpuk River approximately 10 miles south of Smith Bay. Options for winter access to and from the proposed drilling sites include the following:

- Hardened overland trail between the Puviaq sites and Spark 5 drill site (approximately 73 miles) or the Hunter drill site (approximately 85 miles), connecting to authorized winter access corridors leading to the existing transportation system east of NPR-A (e.g., Kuparuk oil field facilities)
- Ice road and/or hardened overland trail between the Puviaq sites and Barrow (approximately 68–82 miles)
- Hardened overland trail between the Puviaq sites and Camp Lonely (approximately 34 miles)
- Hardened overland trail from the Puviaq sites north along Teshekpuk Lake to Harrison Bay (approximately 49 miles) and then along near shore sea ice to Alpine or Kuparuk.

Additional access will be provided by an ice airstrip constructed near the Puviaq sites for large aircraft (e.g., Hercules and similar aircraft) that would transport materials, supplies, and personnel for part or all of the proposed activities.

Except for optional winter travel on near-shore sea ice, all of the proposed activities would take place within the Arctic Coastal Plain. Topography is generally flat to gently rolling and is dominated by permafrost-related geomorphic features. These include polygonal patterned ground, shallow lakes, and extensive areas of wetland interlaced with small, meandering streams.

Surficial deposits of the general area are marine silts, sands, and outwash gravels, with permafrost ranging from 650 to 1,330 feet deep. The active thaw layer is

typically 1 to 2 feet deep.⁴⁴ Soils are typically wet throughout the area, although upland features such as pingos and some river benches are well-drained, as are sand dunes along the coast. Areas east of Hunter are described in EA: AK-023-01-023, which is incorporated herein by reference.⁴⁵

3.1.1 Water Resources

The proposed drilling operations are associated with the Miguakiak River approximately 4.5 miles above its confluence with the Ikpihpuk River. The Miguakiak River is approximately 27 miles long, with a total drainage area of 2,460 square miles, including 556 square miles for Teshekpuk Lake.⁴⁶ The Miguakiak River is usually an outlet from Teshekpuk Lake; however, water has been recorded flowing up the Miguakiak River into Teshekpuk Lake under certain flood conditions on the Ikpihpuk River.⁴⁷ Under such reversed flow conditions, the two Puviaq drill sites would be about 22.5 miles upstream from Teshekpuk Lake. Under normal flow conditions, the two drill sites are about 9.5 miles upstream from the Ikpihpuk River Delta.

Winter access routes cross several waterbodies: Miguakiak River (access between the two drill sites), unnamed lakes, Meade River, Inaru River, Oumalik River, Topugoruk River, Okpiksak River, Alaktak River, Chipp River, Ikpihpuk River, and the near-shore ice on the western side of Teshekpuk Lake. Waterbody crossings would be at sites with low bank relief and, where possible, places where the waterbody freezes to the bottom. Ice roads may require construction of minor ice bridges at some waterbody crossings.

Optional overland trail routes to relocate the drill rig when the proposed project is completed involve crossing near-shore sea ice at the head of Admiralty Bay (access to and from Barrow) and Harrison Bay (access to established transportation facilities east of NPR-A).

Special land use designations associated with water resources in the project area are summarized in [Table 4](#).

Waterbodies west of the Ikpihpuk River between Barrow and the Puviaq drill sites have not been given Fish Habitat LUEA designations. However, it is likely that when the present land use planning process/EIS is

Table 4 Water-Related Special Areas

Special Area	Project Components
Teshekpuk Lake Watershed LUEA ⁴⁸	Puviaq drill sites and associated facilities, hardened overland trail to Camp Lonely, hardened overland trail to Harrison Bay, hardened overland trail to the authorized Hunter drill site, and a remote camp pad at the Kogru Naval Landing Site on the peninsula between Harrison Bay and marine waters of the Kogru River
Goose Molting Habitat LUEA ⁴⁹	Hardened overland trail involving Camp Lonely and hardened overland trail to Harrison Bay via the north side of Teshekpuk Lake
Spectacled Eider Breed Range LUEA ⁵⁰	Puviaq drill sites and associated facilities, hardened overland trail to Camp Lonely, hardened overland trail to Harrison Bay via the north side of Teshekpuk Lake, the western most part of the hardened overland trail to the authorized Hunter drill site, and a remote camp pad at the Kogru Naval Landing Site on the peninsula between Harrison Bay and marine waters of the Kogru River
Teshekpuk Lake Special Area ⁵¹	Puviaq drill sites and associated facilities, hardened overland trail to Camp Lonely, hardened overland trail to Harrison Bay via the north side of Teshekpuk Lake, hardened overland trail to the authorized Hunter drill site, and a remote camp pad at the Kogru Naval Landing Site on the peninsula between Harrison Bay and marine waters of the Kogru River
Teshekpuk Lake Fish Habitat LUEA ⁵²	NW leg of the hardened overland trail to the authorized Hunter drill site and portion of trail to Harrison Bay
Miguakiak River Fish Habitat LUEA ⁵³	Road/trail connecting Puviaq drill sites and associated water supply lakes
Ikpihpuk River Fish Habitat LUEA ⁵⁴	Ice road and/or hardened overland trail to Barrow

completed, the following waterbodies will have been considered for such a designation: Inaru River, Oumalik River, Topagoruk River, Okpiksak River, Alaktak River, and Chipp River. These waterbodies

⁴⁸ IAP/EIS. Figure II.B.1. p. II-4.

⁴⁹ IAP/EIS. Figure II.B.2. p. II-5.

⁵⁰ IAP/EIS. Figure II.B.3. p. II-6.

⁵¹ IAP/EIS. Figure II.B.11. p. II-14.

⁵² IAP/EIS. Figure II.B.5. p. II-8.

⁵³ IAP/EIS. Figure II.B.5. p. II-8.

⁵⁴ IAP/EIS. Figure II.B.5. p. II-8. Note that this EA assumes that there would be an LUEA designation of habitat areas for the west side of the Ikpihpuk River similar to that designated for the east shore. This assumption is consistent with the establishment of the Teshekpuk Lake Special Area, which includes land on both sides of the Ikpihpuk River in the project area referenced above.

⁴⁴ USDOI BLM. EA: AK-023-02-033. p. 5.

⁴⁵ USDOI BLM. EA: AK-023-01-003. pp. III-1 through III-3.

⁴⁶ IAP/EIS. p. III-A-46.

⁴⁷ IAP/EIS. p. III-A-50.

would be crossed by the ice road or hardened overland trail. A remote camp would be located on uplands near the head of Admiralty Bay.

Authorized waterbody crossings between the Puviaq drill sites and Hunter exploration drill site (used to access the over-summer ice pad to store drilling equipment for use at Puviaq) may be reused, as may authorized crossings between Hunter and other authorized transportation routes that include the Colville River, Ublutuooh River, Judy Creek, and Fish Creek.

CPAI has identified a need for up to 123.5 MG of fresh water for construction of ice roads/pads/airstrip and drilling and camps for each of 2 winter drilling seasons. If needed, additional water would come from an approved source. Thirty-three lakes have been identified as potential sources of fresh water, as listed in [Table 5](#). Other lakes have been evaluated for prior authorizations to conduct winter exploratory drilling on federal land in NPR-A east of Puviaq sites.

Table 5 New Water Sources to be Permitted

Lake Name	Township	Range	Section(s)	Surface Area (acres)	Max. Depth (feet)	Calculated Volume ^a (MG)	Fish Present ^b	15% of Winter Volume ^c (MG)	Permittable Volume (MG Available)
M0205	16N	10W	28	66.3	18.8	212.99	Yes	9.02	9.02
M0206	16N	10W	22/27/28	63.5	19.5	168.77	Yes	6.29	6.29
M0207	16N	10W	33	26.1	14.5	81.84	Yes	3.13	3.13
M0208	16N	10W	26	14.8	6.5	21.00	Yes	0.00	0.00
M0209	16N	10W	27/34	159.3	10.0	236.79	Yes	1.44	1.44
M0210	15/16N	10W	3/4/33/34	43.4	11.4	64.57	Yes	0.40	0.40
M0211	15N	10W	3	87.0	11.0	203.66	Yes	5.16	5.16
M0212	15N	10W	9	43.6	21.3	112.36	Yes	4.10	4.10
M0213	15N	10W	10/15	38.2	18.4	71.24	Yes	2.20	2.20
M0214	15N	10W	16/17	162.0	18.1	184.84	Yes?	3.96	3.96
M0215	15N	10W	16/17/20/21	219.1	23.2	415.91	Yes	15.01	15.01
M0216	15/16N	10W	1/36	100.4	12.3	191.73	Yes	4.37	4.37
M0217	19N	16W	15/16/21/22	614.4	6.9	1,146.16	Yes	0.00	0.00
M0218	17/18N	12W	3/34	717.2	7.5	872.73	Yes	0.00	0.00
M0219	17N	12W	12	129.6	9.8	245.75	Yes	2.20	2.20
M0220	16N	11W	4	51.6	13.3	106.92	Yes	2.71	2.71
M0221	17N	11W	30/31	452.1	17.6	586.36	Yes	13.07	13.07
M0222	16N	11W	14	82.9	17.5	98.89	Yes	2.62	2.62
M0223	16N	11W	14	171.2	23.5	183.55	Yes	3.79	3.79
M0224	15N	10W	5	99.5	20.8	156.24	Yes	6.64	6.64
M0225	16N	10W	30	65.7	22.2	120.25	Yes?	6.98	6.98
M0226	16N	11W	2	217.8	14.3	309.11	Yes	10.33	10.33
M0227	16N	11W	8	237.4	16.5	433.58	Yes	24.82	24.82
M0228	16N	11W	5/7/8	274.5	16.7	331.25	Yes	6.78	6.78
Tesh Lake (W. basin)	12/13/14/15/16N	4/5/6/7/8/9W	Multiple - see map	See map	21.3	248,289.00	Yes	37,243.00	37,243.00
M0183 ^d	15N	10W	11/14	154.54	12.0	201.43	Yes	2.19	2.19
M0184 ^d	15N	10W	14	105.03	8.5	96.97	Yes	.08	.08
MB0201	22N	18W	22/23/26/27/34/35	1,229.0	8.0	1,068.00	NS ^e	0.32	0.32
MB0202	22N	18W	23/24/25/26/35/36	501.0	8.0	436.00	NS ^e	0.14	0.14

Table 5 (cont.) New Water Sources to be Permitted

Lake Name	Township	Range	Section(s)	Surface Area (acres)	Max. Depth (feet)	Calculated Volume ^a (MG)	Fish Present ^b	15% of Winter Volume ^c (MG)	Permittable Volume (MG Available)
MB0203	19/20/21N	16W	Multiple - see map	8,612.0	9.0	8,417.00	NS ^e	13.86	13.86
MB0204	20N	17W	2/11/12/13	266.0	6.0	173.00	NS ^e	-- ^e	0.40 ^e
MB0205	20/21N	17W	3/35/36	416.0	6.5	294.00	NS ^e	-- ^e	1.80 ^e
MB0206	21N	17W	5/6/7/8	445.0	5.0	242.00	NS ^e	-- ^e	0.00 ^e
TOTAL									37,396.81

Source: Moulton, 2002 fieldwork; Lakes M0183 and M0184 measured in 2001

^a MG = million gallons

^b No = lake does not represent fish habitat; Yes = fish present during survey; Yes? = fish not caught but lake potential fish habitat

^c Winter Volume = (typically) volume below 7 feet [of ice]

^d Lakes were previously permitted in TWUP A2002-16

^e Lakes not sampled for fish. Lakes deeper than 7 feet assumed to have fish; lakes between 5 and 7 feet deep that are unconnected to fish-bearing streams assumed to have only sticklebacks. For lakes between 5 and 7 feet deep, the Applicant has requested a volume of water based on 50 percent of the volume under 5 feet of ice.

Abbreviations: Min = minimum; -- = Not Applicable; NS = Not Sampled

Two of the lakes (M0183 and M0184) were previously authorized for construction of the over-summer ice pad at Puviaq; 25 are newly proposed lakes. Ten fresh water sources are located west of the area evaluated in the IAP/EIS: M0217, M0218, M0220, M0221, M0222, M0223, M0225, M0226, M0227, and M0228.

Data for water temperature, dissolved oxygen specific conductance, pH, turbidity, chloride, sodium, calcium, magnesium, total hardness, and total dissolved solids were collected at potential sources of fresh water associated with the Puviaq project. Findings are within the general ranges of water quality data discussed in the IAP/EIS and BLM data collected in the NPR-A.

Variations among lakes are probably due to modest differences in water type, reflecting specific mineral contents of various watershed soils. Specific conductance, chloride, and total dissolved solids showed a reasonable congruence, but could not be correlated with latitude (i.e., no apparent increase in salinity closer to the coast). In all lakes, ions are excluded from water as it freezes, concentrating solutes in free water below the ice. Even at fairly light loads of chloride (e.g., 25 mg/L), the salts could become quite concentrated in water under the ice.

All potential water supply lakes were found to either have fish present or have the potential to provide overwintering fish habitat. Implementation of the existing standard of limiting withdrawal to 15 percent of the free water under the ice in fish lakes (Stipulation 20) would make three of the lakes (M0208-6.5 feet deep, M0217-6.9 feet deep, and M0218-7.5 feet deep)

unsuitable for wintertime water withdrawal, although ice aggregate could be removed from grounded ice.

3.2 BIOLOGICAL RESOURCES

Biological resources for the two Puviaq drilling sites, ice airstrips, new over-summer drilling equipment storage pad, and optional access routes to the eastern boundary of federal lands within NPR-A are described in the IAP/EIS.⁵⁵ Information about biological resources west of the Northeast Planning Area has been extracted from U.S. Department of Commerce Resource maps.⁵⁶ Areas east of Hunter are described in EA: AK-023-01-023,⁵⁷ which is incorporated herein by reference.

3.2.1 Vegetation

All of the project area, including access corridors between Barrow and the Puviaq drilling sites, has been mapped by BLM in cooperation with Ducks Unlimited, the NSB, and USFWS. The land use classifications used in this EA are based on that inventory.⁵⁸ Tables 6 through 8 summarize various project elements and the associated acreage of vegetation cover types, computer-calculated by placing digitized pads and routes on the digitized land cover map.

⁵⁵ IAP/EIS. pp. III-B-1 through III-B-53.

⁵⁶ U.S. Department of Commerce. North Slope, Alaska: Environmentally Sensitive Areas. Map 1 (scale 1:250,000). September 1999.

⁵⁷ USDOI BLM. EA: AK-023-01-003. pp. III-1 through III-7.

⁵⁸ IAP/EIS, Table III.B.2-1. p. III-B-5.

Table 6 Summary of Land Cover in the Northeast Planning Area

Land Cover Categories ^a Major & Minor Groups	Northeast Planning Area		
	IAP/EIS Table III.B.2-1	Previously Authorized ROW Within NPR-A	
	% of area	Acres	% of area
WATER			
Ice	2.2	--	--
Clear Water	10.8	4.5	0.5
Turbid Water	8.4	13.7	1.5
AQUATIC			
<i>Carex aquatilis</i>	3.8	69.8	7.9
<i>Arctophila fulva</i>	0.4	0.5	0.1
FLOODED TUNDRA			
Flooded Tundra – LCP	6.5	125.1	14.1
Flooded Tundra – NP	2.7	43.9	5.0
WET TUNDRA			
Wet Tundra	5	96.1	10.8
MOIST TUNDRA			
Sedge Meadow	10.1	120.4	13.6
Tussock Tundra	29.1	381.9	43.1
Moss Lichen	1.6	10.4	1.2
SHRUB			
Dwarf/Low Shrub	27.2	15.5	1.7
Tall Shrub	0.1	--	--
BARREN GROUND			
Sparsely Vegetated	0.5	1.3	0.1
Dunes/Dry Sand	0.7	1	0.1
Other	1	2.4	0.3
Totals	100.1 %	886.5	100 %

Source: MWH. November, 2001. All numbers are estimates.

^a Categories defined in IAP/EIS, Table III.B.2-1, p. III-B-5.

-- -- Vegetation type not represented in project area.

LCP – low-centered polygon

NP – non-patterned

ROW – right-of-way

Several rare plants with the potential to occur within the general project area are *Mertensia drummondii*, a blue bell found on sand dune habitats, *Pleuropogon sabinei*, an aquatic grass that may occur between the *Arctophila* and *Carex* zones in lakes and ponds in locations to the north and northeast of Teshekpuk Lake, and *Draba adamsii*, a Whitlow-grass found near Barrow in eroding, turf polygons by the ocean or streams. Other rare plants that may be found in the general area are *Poa hartzii*, a grass from sites on the Meade River, *Erigeron muirii*, a fleabane occurring on some drier soils such as ridges in the foothills region, and *Aster pygmaeus*, found on mudflats and saline soil.⁵⁹ All six rare plant types are herbaceous perennials.⁶⁰

⁵⁹ IAP/EIS. p. III-B-2.

⁶⁰ Pers. Comm. Rob Lipkin, Alaska National Heritage Program. November 2002.

Table 7 Land Cover at Wellsites

Wellsite	Land Cover	Area (acres)
Puviaq 1	Flooded Tundra LCP	2.22
	Sedge Meadow	1.94
	Tussock Tundra	18.13
	Wet Tundra	0.68
Total		23
Wellsite	Land Cover	Area (acres)
Puviaq 2	Clear Water	0.41
	<i>Carex aquatilis</i>	1.12
	Flooded Tundra LCP	10.98
	Flooded Tundra NP	3.18
	Low Shrub	0.32
	Moss / Lichen	1.90
	Sedge Meadow	0.45
	Turbid Water	2.19
	Tussock Tundra	1.81
	Wet Tundra	0.59
Total		23

Note: over-summer ice pad may be part of one drilling pad.

Rarity is a relative term and can be defined in many ways, as described in the Alaska Rare Plant Field Guide.⁶¹ The plants listed above as rare are not listed threatened or endangered species, nor are they candidate or proposed species. The rarity of a species may be based on a number of factors, including known occurrence, distribution, habitat, and vulnerability. Relatively little vegetation plant survey work has been done in most of Alaska, including the North Slope, and a site-specific inventory of the presence of these rare plants has not been conducted in the project area.

⁶¹ Lipkin, R., and D. F. Murray. Alaska Rare Plant Field Guide; Introduction. USFWS, National Park Service, BLM, Alaska Natural Heritage Program, and US Forest Service. 1997. <http://www.uaa.alaska.edu/enri/aknhpweb/index.html>

Table 8 Land Cover Along Access Routes

Vegetation Type	Area (acres)
Barrow – Puviaq 1 (from east end of gravel road)	
<i>Arctophila fulva</i>	3.08
<i>Carex aquatilis</i>	26.75
Clear Water	54.09
Dunes	8.58
Dwarf Shrub	1.25
Flooded Tundra LCP	240.50
Flooded Tundra NP	35.95
Lake Ice	47.30
Low Shrub	2.15
Moss / Lichen	78.86
Other	12.89
Sedge Meadow	87.09
Sparsely Vegetated	3.66
Turbid Water	372.45
Tussock Tundra	94.29
Wet Tundra	80.45
TOTAL	1,149
Vegetation Type	Area (acres)
Barrow – Puviaq 1 (from west end of gravel road)	
<i>Arctophila fulva</i>	11.05
<i>Carex aquatilis</i>	53.82
Clear Water	89.60
Dunes	1.99
Dwarf Shrub	1.13
Flooded Tundra LCP	413.58
Flooded Tundra NP	69.27
Lake Ice	47.30
Low Shrub	19.85
Moss / Lichen	125.19
Other	16.51
Sedge Meadow	124.51
Sparsely Vegetated	2.26
Turbid Water	436.73
Tussock Tundra	132.66
Wet Tundra	119.62
TOTAL	1,665
Vegetation Type	Area (acres)
Barrow – Puviaq 1 (alternative route)	
<i>Arctophila fulva</i>	15.37
<i>Carex aquatilis</i>	70.45
Clear Water	101.85
Dunes	10.35
Dwarf Shrub	22.22
Flooded Tundra LCP	324.93
Flooded Tundra NP	87.55
Lake Ice	81.51
Low Shrub	30.76
Moss / Lichen	98.95
Other	10.69
Sedge Meadow	85.73
Sparsely Vegetated	5.97
Turbid Water	138.29
Tussock Tundra	177.93
Wet Tundra	121.63
TOTAL	1,384

Table 8 continued

Vegetation Type	Area (acres)
Puviaq 1 – Lonely	
<i>Arctophila fulva</i>	4.74
<i>Carex aquatilis</i>	49.21
Clear Water	5.89
Dwarf Shrub	1.50
Flooded Tundra LCP	119.26
Flooded Tundra NP	23.29
Low Shrub	3.47
Moss / Lichen	57.19
Other	4.86
Sedge Meadow	170.89
Sparsely Vegetated	1.61
Turbid Water	37.61
Tussock Tundra	57.86
Wet Tundra	33.38
TOTAL	571
Vegetation Type	Area (acres)
Puviaq 1 – Harrison Bay	
<i>Arctophila fulva</i>	6.60
<i>Carex aquatilis</i>	43.12
Clear Water	5.75
Dunes	0.59
Dwarf Shrub	9.61
Flooded Tundra LCP	177.73
Flooded Tundra NP	41.10
Lake Ice	3.14
Low Shrub	7.95
Moss / Lichen	59.47
Other	0.66
Sedge Meadow	226.22
Sparsely Vegetated	2.81
Turbid Water	60.35
Tussock Tundra	125.22
Wet Tundra	56.44
TOTAL	827
Vegetation Type	Area (acres)
Puviaq 1 – Spark 5/8	
<i>Arctophila fulva</i>	3.22
<i>Carex aquatilis</i>	53.99
Clear Water	91.87
Dunes	4.25
Dwarf Shrub	12.46
Flooded Tundra LCP	105.87
Flooded Tundra NP	31.38
Low Shrub	0.85
Moss / Lichen	27.87
Other	12.00
Sedge Meadow	362.54
Sparsely Vegetated	3.48
Turbid Water	100.55
Tussock Tundra	360.72
Wet Tundra	76.85
TOTAL	1,248

3.3 WILDLIFE

This section discusses wildlife that might be present in the project area during the winter, including owls, ravens, ptarmigan, arctic fox, caribou, rodents, hares, weasels, wolverine, polar bear, and possibly musk oxen and grizzly bear. The project involves a number of special wildlife habitat areas that are summarized in Table 9, under land use designations established in the IAP/EIS.

Table 9 Habitat-Related Special Areas

Special Area	Associated Project Elements
Goose Molting Habitat LUEA	Hardened overland trail to Camp Lonely; hardened trail to Harrison Bay along the north side of Teshekpuk Lake
Spectacled Eider Breeding Range LUEA	Puviaq drill sites and associated facilities; hardened overland trail to Lonely; hardened trail to Harrison Bay along the north side of Teshekpuk Lake; westernmost leg of hardened overland trail to Hunter drill site; and a remote camp pad at the Kogru Naval Landing Site ^a
Teshekpuk Lake Caribou Habitat LUEA	Puviaq drill sites and associated facilities; hardened overland trail to Lonely; hardened overland trail to Harrison Bay along the north side of Teshekpuk Lake; hardened trail to Hunter drill site; and remote camp pad at Kogru Naval Landing Site ^a
Teshekpuk Lake Special Area	Puviaq drill sites and associated facilities; hardened overland trail to Camp Lonely; hardened trail to Harrison Bay via the north side of Teshekpuk Lake; hardened overland trail to the authorized Hunter drill site; and a remote camp pad at Kogru Naval Landing Site ^a

^a Kogru Naval Landing Site is on the peninsula between Harrison Bay and marine waters of the Kogru River.

Wildlife habitats west of the Ikpiuk River that would be crossed by the ice road or hardened overland trail between Barrow and the Puviaq drill sites have not been given LUEA designations; however, it is likely that when the present land use planning process/EIS is completed, the following wildlife habitat areas will have been considered for such a designation: spectacled eider breeding range,⁶² Steller's eider,⁶³ caribou habitat (summer and winter use zone),⁶⁴ and onshore polar bear maternal denning.⁶⁵

⁶² U.S. Department of Commerce. Map 1. September 1999.

⁶³ IAP/EIS. Figure III.B.6-2. p. III-B-50.

⁶⁴ IAP/EIS. Figure III.B.5.a.a-1. p. III-B-40.

⁶⁵ U.S. Department of Commerce. Map 1. September 1999.

3.3.1 Fish

The proposed action involves water withdrawal and/or ice harvesting from 31 lakes not previously permitted. No water will be withdrawn from rivers or streams. Near-shore Rolligon trails on sea ice do not involve water withdrawals from upland freshwater lakes.

CPAI conducted surveys of 25 lakes to determine whether fish were present. This inventory indicated that all of the lakes had fish, or were sufficiently deep that overwintering fish habitat may be present.

The remaining six lakes were not sampled; however CPAI assumed that fish were present. Accordingly, all but two withdrawals were calculated to limit removal to less than 15 percent of the free water regardless of their location on or off federal land covered by the 1998 ROD. For the remaining two withdrawals, (MB0204 and MB0205, both on Native land), the Applicant is in discussion with ADF&G regarding allowable withdrawal. Traditional Knowledge provided by the NSB suggests that fish survival requires lakes with a minimum 8-foot depth.⁶⁶

No systematic inventory has been performed of fish species present in the proposed water supply lakes. It is assumed that those lakes could include one or more species of fish listed in the IAP/EIS,⁶⁷ which include lake trout, arctic grayling, broad whitefish, least cisco, and ninespine stickleback.

3.3.2 Birds

No site-specific baseline studies for water bird habitat were undertaken (with concurrence of the USFWS and BLM) because the project is limited to winter months, when avian populations of special interest are generally absent from the North Slope. These species include the eiders, other waterfowl, and shorebirds. Both the Steller's eider and the spectacled eider are listed under the Endangered Species Act. Neither species is habitat-limited on the North Slope and neither species has designated critical habitat on the North Slope.

3.3.3 Large Mammals

Both caribou and polar bear are of special interest and are directly associated with the proposed winter exploration program.

The Teshekpuk Lake Caribou Herd may be present in the project area during the winter. The IAP/EIS notes

⁶⁶ Letter from NSB to DGC. p.9. October 9, 2002.

⁶⁷ IAP/EIS, p. III-B-6.

that currently the calving area for this herd is to the east of Teshekpuk Lake,⁶⁸ but that the general area surrounding Teshekpuk Lake, including the Puviaq drilling sites, provides calving habitat.^{69, 70}

During the winter, polar bear may be found in or near the proposed project area and especially where activities are close to the coast. Pregnant and lactating females and newborn cubs are the only polar bears that occupy winter dens for extended periods. Pregnant females come to shore in late October or early November to construct maternity dens.

Between 1970 and 1998, maternity dens were recorded at the southeast corner of Admiralty Bay and several miles further inland along the Chipp River.⁷¹ Both recorded den sites are within the general area crossed by the ice road/hardened overland trail from Barrow.

The proposed project involves two potential staging areas on non-federal land at the end of the existing road network about 6 to 8 miles southeast of Barrow. In and near Barrow, polar bears forage for remains of whale carcasses during the fall and early spring hunts.

3.4 SOCIOECONOMIC RESOURCES

Related socioeconomic resources are described in the IAP/EIS,⁷² as well as EA: AK-020-00-011,⁷³ EA: AK-023-01-001,⁷⁴ and EA: AK-023-02-005,⁷⁵ from which this EA is tiered and which are incorporated herein by reference. Those resources include national security, land ownership, local community and subsistence use, paleontological resources, scenic resources and recreation, and wilderness.

3.4.1 National Security

National energy needs and our dependence upon foreign oil are key issues for considering the proposed action to authorize winter exploration to determine the extent, if any, that there may be commercial deposits of oil and gas in the vicinity of the Puviaq drilling sites.

The 2001 National Energy Policy states,

“America’s energy strength lies in the abundance and diversity of its energy resources, and its technological leadership in developing and efficiently using these resources. Our nation has rich deposits of coal, oil, and natural gas. Between 1986 and 2000, production of coal, natural gas, nuclear energy, and renewable energy increased. However, these increases have been largely offset by declines in oil production”.⁷⁶

The U.S. currently consumes over 25 percent of the oil produced worldwide. The share of U.S. oil demand met by imports has been projected to increase from 52 percent in 2000 to 64 percent in 2020. During the past 10 years, the quantities of oil available in the Strategic Petroleum Reserve for use in an emergency situation has declined from 83 days to 54 days, primarily due to growth and increased demand in the U.S.

This increasing reliance on foreign-produced oil is a serious long-term challenge to U.S. security. A number of factors affect the ability to increase domestic energy production. These factors include economics and technology associated with depleted fossil fuel resources in the U.S.; regulatory uncertainty; limitations on access to federal lands with high potential for new discoveries; inadequate or missing infrastructure; and conflicts with other land uses and environmental and public policy goals. All related factors are under consideration by the federal government.

The project area is located in a region considered to have “high” oil potential.⁷⁷ Barrow is supplied with natural gas from the South Barrow and Walakpa gas fields, which were discovered by the federal government in 1949 and 1980. These producing gas field are now owned by the NSB and provide the principal source of energy for Barrow residents and businesses. The Simpson oil field near Cape Simpson (not currently producing) was discovered in 1950.⁷⁸

3.4.2 Land Status

The Puviaq project is located in an area that has been of interest for potential oil and gas exploration since February 27, 1923.⁷⁹ Except for the Barrow area, all

⁶⁸ IAP/EIS. p. III-B-41.

⁶⁹ IAP/EIS. Figure III.B.5.a-1. p. III-B-40.

⁷⁰ USDO. 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Plate 2, Examples of Caribou Movements and Distribution Patterns. p. 73. April 1979.

⁷¹ IAP/EIS. Figure III.B.5.b-1. p. III-B-44.

⁷² IAP/EIS. pp. III-C-1 through III-C-61.

⁷³ EA: AK-020-00-011. pp. III-5 to III-7

⁷⁴ EA: AK-023-01-003. pp. III-6 to III-7.

⁷⁵ EA: AK-023-02-005. pp. III-5 through III-8.

⁷⁶ National Energy Policy, Chapter Five. 2001.

⁷⁷ IAP/EIS. Figure III.A.1.a(3)-11. p. III-A-29.

⁷⁸ IAP/EIS. Table IV.A.5-1a. p. IV-A-42.

⁷⁹ 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding

onshore lands in the NPR-A that are associated with the proposed project are under BLM jurisdiction. Federal lands in these areas have been determined suitable for oil and gas activities (with environmental protections)⁸⁰ such as those proposed in the Puviaq project.

Approximately 14 miles of the ice road/hardened overland trail route between Barrow and the Ikpikpuk River and the two staging areas at the southeastern end of the Barrow road system are on land owned by ASRC and UIC. The remainder of the routings (approximately 54 - 68 miles, depending on option) and remote camp sites on the ice road and on the alternate hardened overland trail route are on federal land under jurisdiction of the BLM. Seven Native Allotments east of the Ikpikpuk River are roughly 1.5 - 5.5 miles from the two drill sites. Prime access routes do not cross any of these allotments, but would be very close to several. Going west from the Ikpikpuk River, the ice road/ hardened overland trail routes come close to, but do not cross, a number of Native Allotments, which are primarily concentrated along the southwestern shore of Admiralty Bay and the northern and southern ends of Lake Tusikvoak.

Federal lands west of the Ikpikpuk River are currently being evaluated to determine the extent that oil and gas activities are appropriate and what environmental protection measures should be applied to areas determined suitable for oil and gas leases. Lands in the general area were previously deemed suitable for leasing under the NPRPA, as amended in 1980.

3.4.3 Fiscal Effects

The economies of Alaska and the NSB are heavily dependent upon oil and gas revenues. These include lease bonuses and rentals (\$223.2 million from five lease sales in NPR-A since 1982 plus \$40.2 million in 1999), royalties from production, corporate income taxes (\$162.7 million in State taxes in Fiscal Year 2000 and \$488 million in federal taxes), NSB property taxes (\$195 billion in 2000), and employment (39 percent of the average monthly employment and 50 percent of the average annual earnings for NSB residents) as described in EA: AK-023-02-005, pp. 6 and 7, which is incorporated herein by reference. On a state-wide basis, the petroleum industry generates 20 percent of all private sector payroll and 12 percent of all private sector jobs.⁸¹

Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Land Resources, Plate No. 1, Land Status. p. 145. April 1979.

⁸⁰ IAP/EIS ROD. 1998.

⁸¹ McDowell Group. Economic Impact of the Oil and Gas Industry in Alaska. January 15, 2001.

3.4.4 Local Communities and Subsistence Use

Local communities east of Puviaq are described in EA: AK-020-00-011 (p. III-5). Accordingly, this EA focuses on Barrow (staging and logistical support for the proposed project) and Atqasuk, which is near the hardened overland trail route from Barrow.

Barrow has a population of about 4,580 permanent residents. It is a 1st Class City and the economic center for the NSB. The U.S. Census for 2000 recorded 1,620 housing units, of which 208 were vacant and 41 used seasonally. At that time, 1,986 residents were employed, with a medium household income of \$67,097 and per capita income of \$22,902; 8.6 percent of the residents were living below the poverty level. The NSB is the primary employer with numerous businesses that support services to oil field operations. Many Barrow residents rely upon subsistence food sources, including whale, seal, polar bear, walrus, duck, caribou, grayling, and whitefish. Seven residents hold commercial fishing permits.⁸²

Atqasuk has a population of about 290 permanent residents of which 94.3 percent are Alaska Native or part Native. In 2000, there were 60 housing units, of which 5 were vacant. At that time, 66 residents were employed, with a median household income of \$66,607 and per capita income of \$14,732 with 15.58 percent of residents living below the poverty level. Education and other government services provide the majority of full-time employment. Residents of Atqasuk use grayling, white fish, caribou, geese, ptarmigan, polar bear, seal, walrus, and whale for subsistence. Trapping provides an opportunity for supplemental cash income.⁸³

Residents of Nuiqsut use the general project area, including the coastal areas extending west to Barrow, for harvesting caribou.⁸⁴ The ice road and the hardened overland trail between the drill sites and Barrow are within the northern limits of areas that residents of Atqasuk use for harvesting subsistence resources.^{85, 86}

⁸² Alaska Department of Community and Economic Development. Web page at: www.dced.state.ak.us/cbd/commundb/CF_CIS.cfm October 20, 2002.

⁸³ Alaska Department of Community and Economic Development. Web page at: www.dced.state.ak.us/cbd/commundb/CF_CIS.cfm October 20, 2002.

⁸⁴ IAP/EIS. Figure III.C.3-10. p. III-C-26.

⁸⁵ 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Native Livelihood, Section 1. Plate No. 5, Summary Land Use Map. p. 23. April 1979.

⁸⁶ IAP/EIS, Figure III.C.3 1. p. III-C-9.

However, the primary subsistence users reside in Barrow.⁸⁷

CPAI has consulted with local residents, the NSB, and the NPR-A SAP to ensure that the proposed winter exploration project does not unreasonably restrict access to subsistence resources and to Native Allotments.

3.4.5 Cultural Resources, Wilderness and Primitive Recreation, Potential Wild and Scenic Rivers, and Paleontological Resources

CPAI located project elements to avoid cultural resources, prehistoric and historic sites, and subsistence use sites. Key Barrow residents, selected NSB Planning Commission members, Native Allotment owners, and long-term subsistence cabin owners were included in summer site visits to identify potential conflicts. Site investigations by a qualified archaeologist and coordination with the NSB and others, including the NPR-A SAP, indicate that the ice road and hardened overland trail, the two Puviak drill sites and associated facilities, and access to lakes proposed for sources of water and/or ice chips would not impact any of these resources.

The project area has low relief and is dotted with lakes and freshwater marshes. Overall the area has not been identified as having “highest” visual variety and contrast value.⁸⁸ The project is near two areas previously identified with “Outstanding Wilderness” value: Teshekpuk Lake Area and Ikpikpuk River.⁸⁹ The general area is remote, and except for a few cabins on Native Allotments and former oil and gas drill sites developed by the federal government, offers opportunities for primitive recreation because it is large and undeveloped. The cabins are largely inaccessible until July or August when wheeled or float plane allow access. This past year, fixed wing aircraft from Barrow were unavailable, and CPAI provided transportation for cabin owners via helicopter. Cross-country hiking is generally not attractive due to the extensive wetlands; inland waterbodies tend to be shallow, which is not conducive to recreational boat travel.

⁸⁷ IAP/EIS. Figure III.C.3 17. p. III-C-35, and IAP/EIS. Figure III.C.3-18, p. III-C-18, and IAP/EIS, Figure III.C.3-19. p. III-C-37.

⁸⁸ 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Section 5. Plate No. 1, Scenic Quality Units and Sites (Cultural Modifications) with Rehabilitation Potential. p. 61. April 1979.

⁸⁹ 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Section 4. Plate No. 7, Outstanding Wilderness Resource Areas and Their Wilderness Attributes. p. 53. April 1979.

Present uses are primarily for subsistence by local residents and for winter travel to and from Barrow and Atkasuk. There is very little recreational use from visitors outside the local area. The 1998 IAP/EIS and ROD determined that the project area east of the Ikpikpuk River was suitable for oil and gas leasing, and CPAI acquired the federal leases where winter exploratory drilling is currently proposed.

The Ikpikpuk River and the Miguakiak River were both evaluated for potential designation as units of the National Wild and Scenic Rivers System. Neither was determined eligible for designation.⁹⁰ The Meade River downstream from Atkasuk to Admiralty Bay has been examined for potential inclusion in the National Wild and Scenic Rivers System and found to not qualify.⁹¹ The Chipp River and Alaktak River (distributaries of the Ikpikpuk River that flow into Admiralty Bay) have also been reviewed for possible inclusion in the National System, with no decision at this time.⁹²

The Ikpikpuk River Paleontological Sites LUEA extends along section lines from the eastern shore of the river. The river cuts through mainly Quaternary age fossil-bearing formations, causing many specimens to be deposited on the shore or sandbanks.⁹³ These specimens include Pleistocene mammoth and other mammalian remains.

“While these resources are important as they relate to archaeological investigations and the Mesa Site and the North Slope, they are not as significant as the paleontological values [dinosaur fossils] found on the Colville River and thus not considered outstandingly remarkable in a regional context.....”⁹⁴

For the purposes of this EA, it is assumed that the construction of an ice road or hardened overland trail on the west side of the Ikpikpuk River would have the same paleontological values as the east side of the Ikpikpuk River. Both rivers would be crossed by the ice road and hardened overland trail between Barrow and the two Puviak drill sites.

⁹⁰ IAP/EIS. Table III.C.6-1. p. III-C-53.

⁹¹ 105(c) Final Study, Volume 1—Summaries of Values and Resource Analysis and Land Use Options (Excluding Petroleum Values and Uses) for the National Petroleum Reserve in Alaska. Section 3. Plate No. 1, Rivers Examined for Possible Inclusion in the National Rivers System and Major Sport Hunting Areas. p. 35. April 1979.

⁹² IAP/EIS. Figure III.C.6-2. p. III-C-51.

⁹³ IAP/EIS. p. II-3.

⁹⁴ IAP/EIS. p. III-C-53.

**Figure 3 North Slope Oil and Gas Fields
Administrative Boundaries**

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